

Roll.No.

20UMAET5001

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.

B.Sc Mathematics- END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - V

20UMAET5001- Numerical Methods

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

Section B

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. Evaluate $\sqrt{12}$ by using Newton Raphson method correct to 3 decimal places.
2. Solve the system of equations by Guass elimination method. $x + 2y + z = 3$,
 $2x + 3y + 3z = 10$, $3x - y + 2z = 13$.
3. Find the function $f(x)$ from the following table and hence evaluate $f(6)$ by Newton's method.

x	1	2	7	8
f(x)	1	5	5	4

4. Evaluate $I = \int_0^6 \frac{1}{1+x} dx$ using

(i) Trapezoidal rule (ii) Simpson's one-third rule.

5. Using Euler's method, Solve numerically the equation, $y' = x + y$, $y(0) = 1$, for $x = (0.0), (0.2), (1.0)$.
6. Find the positive root of $x^3 - x = 1$ correct to four decimal places by bisection method.
7. Solve the system of equations by Guass seidal method.
 $10x + 2y + z = 13$, $x + 10y - 2z = 9$, $3x - y + 10z = 12$.
8. Using Lagrange's interpolation formula find $y(10)$ from the following table.

x	5	6	9	11
y	12	13	14	16

Section C

Answer any **THREE** questions ($3 \times 10 = 30$ Marks)

9. Find a positive root of $x - \cos x = 0$ by Regula falsi method correct to four decimal places.

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10. Apply Gauss forward formula to obtain $f(x)$ at $x = 3.5$ from the table below

x	2	3	4	5
f(x)	2.626	3.454	4.784	6.986

11. From the data given below, find the value of x when $y = 13.5$

x	93.0	96.2	100.0	104.2	108.7
y	11.38	12.80	14.70	17.07	19.91

12. The population of a certain town is given below. Find the rate of growth of the population in 1931, 1941, 1961 and 1971.

Year x	1931	1941	1951	1961	1971
Population in thousands y	40.62	60.80	79.95	103.56	132.65

13. Obtain the values of y at $x = 0.1, 0.2$. Using Runge Kutta fourth order for the differential equation $y' = -y$, given $y(0) = 1$.
